

WHAT IS CLAIMED IS:

1. A method for preventing a reverse rotation of an engine, comprising:
determining if a predetermined monitoring condition for monitoring a reverse
rotation of the engine is satisfied;

5 determining if an operation of a starter motor has stopped, when the monitoring
condition is satisfied;

determining if the reverse rotation of the engine is occurring, when the
operation of the starter motor has stopped; and

10 stopping an operation of the engine by stopping at least one of fuel injection
and ignition of the engine when the reverse rotation of the engine is occurring.

2. The method of claim 1, further comprising determining if starting of
the engine is finished when the monitoring condition is not satisfied,

wherein the determining if the predetermined monitoring condition is satisfied
is executed when the starting of the engine is not finished.

15 3. The method of claim 1, wherein the predetermined monitoring
condition comprises a plurality of conditions including:

(1) a crank position sensor (CPS) and a vehicle speed detector operate
normally;

(2) an ignition key is in an on position;

20 (3) an engine speed is less than or equal to a predetermined reference
engine speed or a rate of change of the engine speed is less than or equal to a
predetermined rate of change;

(4) sufficient signals are obtained from the CPS such that cylinders may be
identifiable on the basis thereof; and

25 (5) a vehicle speed is less than or equal to a predetermined reference
vehicle speed.

4. The method of claim 3, wherein:

the reference engine speed is preset lower than a predetermined idle speed of
the engine; and

30 the predetermined engine speed rate of change is a negative value such that an

engine stall may be expected in the case that the rate of change of the engine speed becomes less than the predetermined rate of change.

5. The method of claim 3, wherein the reference vehicle speed is preset as a minimal value indicative of a running of the vehicle.

5 6. The method of claim 1, wherein whether the operation of a starter motor has stopped is determined on the basis of a current battery voltage of the vehicle.

7. The method of claim 6, wherein whether the operation of a starter motor has stopped is determined on the basis of whether the current battery voltage is greater than a predetermined voltage, the predetermined voltage being lower than a battery voltage output in the case that the engine is stopped.

10 8. The method of claim 1, wherein whether the reverse rotation of the engine is occurring is determined on the basis of intervals between adjacent signals from the CPS.

9. The method of claim 8, wherein:
15 the intervals between adjacent signals comprise first, second, and third intervals that are consecutively obtained; and
whether the reverse rotation of the engine is occurring is determined on the basis of whether the second interval is greater than the first and third intervals and also greater than a predetermined reference interval.

20 10. The method of claim 1, further comprising identifying a reversion-triggering cylinder which is in a compression stroke at the time when the reverse rotation of the engine is occurring.

11. The method of claim 10, wherein the identifying a reversion-triggering cylinder identifies the reversion-triggering cylinder on the basis of:

25 a predetermined combustion sequence of cylinders of the engine; and
TDC of a compression stroke of a reference cylinder, the TDC being determined by a reference pulse of a CPS signal.

12. The method of claim 10, further comprising calculating a piston angle of the reversion-triggering cylinder at the time of occurrence of the reverse rotation of the engine, wherein whether the reverse rotation of the engine is occurring is determined on the basis of the piston angle of the reversion-triggering cylinder.

5 13. The method of claim 12, wherein the reverse rotation of the engine is determined to be occurring when the piston angle of the reversion-triggering cylinder lies in a range preceding TDC of the reversion-triggering cylinder.

14. The method of claim 8, wherein the determining a reversion-triggering cylinder determines the reversion-triggering cylinder on the basis of:

10 a predetermined combustion sequence of cylinders of the engine; and
TDC of a compression stroke of a reference cylinder as determined by a reference pulse of a CPS signal.

15 15. The method of claim 14, further comprising calculating a piston angle of the reversion-triggering cylinder at the time of occurrence of the reverse rotation of the engine, wherein whether the reverse rotation of the engine is occurring is determined on the further basis of the piston angle of the reversion-triggering cylinder.

16. The method of claim 15, wherein the reverse rotation of the engine is determined to be occurring when the piston angle of the reversion-triggering cylinder lies in a range preceding TDC of the reversion-triggering cylinder.